

Attorney Docket No.: DRE0166US
Inventors: Ko et al.
Serial No.: 10/577,709
Filing Date: August 18, 2006
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Amendments to the Specification:

Please replace the paragraph beginning at line 7 of page 5 with the following:

Further, it is believed that the respective deformation characteristics of synthetic spider silk or silkworm silk and carbon nanotube are compatible. For example, it has been postulated that the most effective use of the tensile properties of two materials in a combined system is to have compatible elongation at break. The theory of elongation balance is well known in textile design (Ko, F.K., Krauland, K., and Scardino, F., "Weft Insertion Warp Knit for Hybrid Composites," Progress in Science and Engineering of Composites, eds. Hayashi et al., ICCM-V, Fourth International Conference on Composites, 1982, p. ~~982~~ 1169-1176) and in composite analysis (ACK theory; ~~Aversten~~ Aveston, J. Cooper, G., Kelly, A., In Properties of Fiber Composites. Conf. Proc. National Physical Laboratory, Guildford, UK:IPC. P.15). On the basis of elongation balance spider silk (20-30% elongation at break) and carbon nanotube (6-30% elongation at break) are among the most compatible material systems of known strong fibers. Thus, it is believed that a natural liquid crystalline polymer such as spider silk along with very small quantity of carbon nanotube, preferably in the range of about 1% to about 10% by weight, can be combined to produce light weight and high strength super fibrils by the electrospinning process.

Please replace the paragraph beginning at line 19 of page 6 with the following:

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It is believed that carbon nanotube can also be used to reinforce the ~~strange~~ strand of silk fibers of Bonbyx mori, more commonly referred to as silkworm. Thus, the present invention is also applicable to silkworm silk.

Please replace the paragraph beginning at line 8 of page 7 with the following:

The spider or silkworm silk/carbon nanotube fibrils of the present invention are multifunctional materials having not only an unmatched level of combined strength and toughness but also having the function of controlled level of electrical conductivity. The spider or silkworm silk/carbon nanotube fibers are also biocompatible. Thus, the fibers of the present invention are useful in biomedical devices including, but not limited to surgical implants, sutures, tissue engineering scaffolds and drug delivery agents. The ~~finess~~ fineness (nanoscale diameter) and the electrical conductivity also renders them useful as electrodes for brain/machine interfaces and numerous other applications including, but not limited to neuron regeneration. The strength and toughness of these fibers also renders them useful in areas of blast and ballistic protection, for example, in bulletproof vests, armor, ceramic tile constrains and cargo explosion constrains.